

Appl. No. : 10/654,542
 Filed : September 2, 2003

AMENDMENTS TO THE CLAIMS

Claims 1-7 and 9-27 were pending prior to the amendments herein. Please amend Claims 1, 14, and 27 as indicated below. Please cancel Claim 24 without prejudice.

Claims 1-7, 9-23, and 25-27 are therefore pending.

1. (Currently Amended) A carrier for processing a surface of a workpiece using a process surface, comprising:

a carrier housing;

a base configured to hold the workpiece and movable with respect to the carrier housing; and

a single pressure member between the base and the carrier housing, the pressure member configured to apply a single force to the base and to move an entirety of the base with respect to the carrier housing to cause the base to apply [[a]] the force onto the process surface, wherein a spring constant of the process surface is greater than a spring constant of the pressure member.

2. (Original) The carrier of claim 1, wherein the pressure member includes a spring.

3. (Original) The carrier of claim 1, wherein the pressure member is a compressed fluid controlled by a pneumatic system.

4. (Original) The carrier of claim 1, wherein the process surface is a surface of a workpiece surface influencing device.

5. (Original) The carrier of claim 1, wherein the process surface is a surface of a polishing pad.

6. (Original) The carrier of claim 1, wherein:

the carrier housing includes a cavity; and

the base includes a shaft configured to slide within the cavity.

7. (Previously Presented) The carrier of claim 6, wherein the pressure member attaches the base to the carrier housing, the pressure member being within the cavity.

8. (Canceled)

9. (Original) The apparatus of claim 6, wherein the cavity includes bearings to minimize friction between the shaft of the base and the carrier housing as the shaft moves within the cavity.

Appl. No. : 10/654,542
Filed : September 2, 2003

10. (Previously Presented) The carrier of claim 1, wherein the carrier housing includes a stop member and the shaft of the base includes a limiting member configured to mate with the stop member when the pressure member moves the shaft beyond a travel limit range of the base relative to the carrier housing.

11. (Previously Presented) The apparatus of claim 10, wherein the pressure member is configured to cause the base to exert substantially a same force against the process surface throughout the travel limit range of the base.

12. (Original) The apparatus of claim 1, wherein the carrier housing and the base are rotatably coupled to rotate as a single unit.

13. (Original) The apparatus of claim 12 further comprising a flexible diaphragm coupled to the base and the carrier housing.

14. (Currently Amended) A method for processing a semiconductor wafer using a constant force carrier head comprising the steps of:

holding the semiconductor wafer with a base; and

urging substantially an entire surface of the base by applying a single force to the base with a single pressure member to produce a substantially constant force against a process surface, wherein a spring constant of the process surface is greater than a spring constant of the pressure member.

15. (Previously Presented) The process of claim 14, wherein the process surface is a surface of a workpiece influencing device.

16. (Original) The method of claim 14, wherein the process surface is a surface of a polishing pad.

17. (Previously Presented) The method of claim 14, further comprising the step of providing relative motion between the base and the process surface.

18. (Original) The method of claim 14, further comprising the step of rotating the carrier head.

19. (Original) The method of claim 18, wherein the carrier head and the base rotate as a unit.

20. (Previously Presented) The method of claim 14, wherein the pressure member causes the base to apply a constant force against the process surface along a displacement axis against the process surface.

Appl. No. : 10/654,542
Filed : September 2, 2003

21. (Original) The method of claim 14, further comprising the step of limiting a range of motion along a displacement axis of the base against the process surface.

22. (Original) The method of claim 14, wherein the pressure member is a spring.

23. (Original) The method of claim 22, wherein the process surface is compressible.

24. (Canceled)

25. (Original) The method of claim 14, wherein the pressure member is pneumatic.

26. (Original) An article of manufacture using the method of claim 14.

27. (Currently Amended) A method of processing a surface of a workpiece on a process surface while holding the workpiece with a carrier head comprising a base, comprising:

contacting the surface of the workpiece to the process surface with a single constant pressure exerted across an entire surface of the base holding the workpiece by a single pressure member within the carrier head, wherein the carrier head is configured to move the surface of the workpiece along a displacement axis; and

processing the surface of the workpiece with the processing process surface while maintaining the constant pressure, wherein a spring constant of the process surface is greater than a spring constant of the pressure member.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 8/6/07

By: Adam Gilbert

Adam Gilbert
Registration No. 59,967
Attorney of Record
Customer No. 20,995
(949) 760-0404

4100003
080607